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Title: Ski Binding or Snowboard Binding

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Munich, September 10, 2001
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Field of the Invention

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A corresponding ski binding is known from German Utility Model 91 17 298 U1. According to this publication, separate guide rail plates are arranged on the ski for the boot holder component on the toe end and on the heel end, with the above-mentioned components being guided displaceably in these guide rail plates in the longitudinal direction of the ski. The boot holder components are connected by means of toothed rods to a pinion which is accommodated in a housing arranged between the two guide rail plates and which engages with the two toothed rods in such a way that the boot holder components are moved toward or away from one another, depending on the direction of rotation, as the pinion is rotated. The set positions of the boot holder components are locked by means of a lock for the pinion or a locking device by means of which at least one boot holder component can be locked on the respective guide rail plate.

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has a borehole with an internal screw thread to receive fastening screws of snowboard bindings, are guided displaceably but unrotatably in each guide rail. When the fastening screws are screwed into the threaded boreholes with a significant torque, the sliding blocks and thus the snowboard bindings are fixedly secured on the snowboard or in the guide rails. The guide rails offer the possibility of practically infinitely variable positioning of the bindings on the snowboard.

As a rule, however, bindings on skis and snowboards are secured directly with fastening screws that have previously been screwed into boreholes provided in predetermined positions on the ski or snowboard.

SUMMARY OF THE INVENTION

The object of this invention is to permit rigging of ski bindings and snowboard bindings mostly without the use of tools and to permit the lowest possible burden on the ski or snowboard due to the binding.

This object is achieved according to this invention by a ski binding or a snowboard binding having boot holder components on the front end or the toe end and on the rear end or the heel end, said boot holder components being displaceably secured vertically in a fixed manner on the ski with a form-fitting connection on a rail guide which extends in the longitudinal direction of the ski on the side of the ski or the snowboard, said rail guide being integrated into the ski or snowboard and being connected or connectable by means of connection elements in the longitudinal direction of the rail guide on a holder that is or can be secured in a fixed manner on the ski or snowboard between the boot holder components.

This invention is based on the general idea of inserting boot holder components into guide rails which are present

on the ski or snowboard and securing said boot holder components by means of a form-fitting connection, additionally in the longitudinal direction of the rail guide, and accomplishing their fixation in the longitudinal
5 direction of the rail guide by means of connection elements that are separate from the ski or snowboard and are anchored in a practically fixedly predetermined position on a holding device.

10 This invention offers the advantage that the ski or snowboard can be designed to withstand high loads in the area of the holding device without having any negative effect on flexibility, and tensile forces occurring between the boot holder components can be largely kept away from
15 the structure of the ski or snowboard.

This offers the advantageous possibility of arranging rail guides with very flexible guide rails, such as single rails, double rails, T-shaped rails or U-shaped rails, in
20 particular even segmented guide rails, which may be desirable from the standpoint of optimum bending behavior of the ski and snowboard.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

25 According to a first preferred embodiment of this invention, the holding device or a housing of the holding device may be securable in particular on a central section of the rail guide, i.e., the rail guide is also used for the holding device.

30 Instead of this, it is also possible and advantageous for the holding device or its housing to be integrated at least partially into the ski or snowboard or into the structure of the ski or snowboard.

35 In addition, this invention also claims protection for a ski binding or a snowboard binding having boot holder

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components on the front end or the toe end and on the rear end or the heel end which are secured displaceably on the ski or the snowboard in a fixed manner in the vertical direction with a form-fitting connection on a guide rail
5 extending in the longitudinal direction of the ski or snowboard, and which are or can be connected in the longitudinal direction of the rail guide by means of connection elements to a holding device which is or can be secured on the ski or snowboard and is arranged between the
10 boot holder components, said connection elements being adjustable against a self-locking effect.

This implements the general idea of providing a continuously effective restricted guidance for locking the
15 respective positions set for the boot holder components such that it cannot be eliminated inadvertently or on purpose.

In an especially expedient embodiment, the connection
20 elements are formed by a threaded spindle which is in an axially fixed rotational mount on the holding device and is screwed with a right-handed threaded section into an element with an internal screw thread of the one boot holder component, and a left-handed threaded section is
25 screwed into a corresponding element having an internal screw thread on the other boot holder component, so that with a rotational adjustment of the threaded spindle, the boot holder components are brought either closer together or farther apart from one another. With this arrangement,
30 the two boot holder components are displaced toward one another in opposite directions when the threaded spindle is turned.

Instead of this, it is also possible to provide separate
35 threaded spindles for the two boot holder components. With this design, it is optionally also possible to provide for each threaded spindle to be mounted in an axially fixed

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manner on the respective boot holder component and screwed into an internal screw thread element on the holding device to permit variation of the distance between the boot holder component and the holding device through a rotational adjustment of the respective spindle.

In all embodiments, the boot holder components may each have a base plate that is displaceable in the respective rail guide and is or can be connected to the holding device by means of the connection element. Then a front or rear boot holding device is mounted on the respective base plate, in which case one of these boot holding devices may be arranged displaceably relative to a base plate against a push-off resiliency which attempts to push this boot holding device in the direction of the other boot holding device. This push-off resiliency guarantees that the boot to be secured will be held in the boot holder components without any play; in addition, in the case of flexing movements of the ski, unwanted twisting between the boot and the boot holder components is prevented.

Brief Description of the Drawings

Moreover, with regard to preferred features of this invention, reference is made to the claims and the following explanation of the drawings, on the basis of which especially preferred embodiments of this invention are described in greater detail.

They show:

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Figure 1: a schematic side view of a detail drawing of a ski having a ski binding according to this invention,

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Figure 2: a sectional diagram according to sectional line II-II in Figure 1, and

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Detailed Description of the Preferred Embodiments

5 A ski 1, which may basically have a traditional design, has on its top side two rails 2 extending in the longitudinal direction of the ski in the central area of the ski, each rail having profiles symmetrical with the central longitudinal vertical plane of the ski in the example illustrated here in Figure 2, with edge webs pointing upward and outward obliquely. A front base plate part 3, a rear base plate part 4 and a holding device housing 5 arranged between the base plate parts 3 and 4 are displaceably guided on these rails 2 in the longitudinal direction of the ski, with the holding device housing 5 being undisplaceably secured by splints 6 which are inserted into corresponding, aligned recesses in the holding device housing 5 and rails 2.

20 A threaded spindle 7 is mounted radially and axially in the holding device housing 5, having a toggle-shaped handle 8 which is accessible through an upper opening in the holding device housing 5 for actuation of its rotational movement. This handle 8 can serve the function of axially undisplaceable mounting of the threaded spindle 7 in interaction with transverse walls of the holding device housing 5 through which the threaded spindle passes.

Threaded spindle 7 has right-handed threaded sections 7' and left-handed threaded sections 7" projecting out of the holding device housing 5 in the longitudinal direction of the ski, said threaded sections being screwed into corresponding nuts 9 and 10, which are in turn arranged in a fixed manner or at least an axially fixed manner inside the base plate parts 3 and 4. With the distance between the base plate parts 3 and 4 being increased or reduced in the longitudinal direction of the skis, depending on the

direction of rotation of the threaded spindle 7.

Due to the self-locking design of the threaded sections 7' and 7" of the threaded spindle 7 as well as the nuts 9 and 10 which work together with the threaded spindle, the distance set between the base plate parts 3 and 4 remains unchanged without any special securing measures. However, an additional releasable lock may also be provided. For example, the toggle-shaped handle 8 may also be secured against displacement by means of a catch lever or a lock lever, or it may be secured by the fact that a cover closing the access opening for the handle 8 in the holding device housing 5 also functions as a lock in its closed position.

To optionally be able to perform a rapid adjustment of the threaded spindle 7, a conical gearwheel 11 which is connected to the handle 8 in one piece or is integrally molded onto the handle 8 in the example of Figure 3 can be arranged in a rotationally fixed manner on the threaded spindle 7. This conical gearwheel 11 works together with another conical gearwheel 12 which can rotate about an axis perpendicular to the top side of the ski within the holding device housing 5 and has a projection 13 which is accessible from the top side of the holding device housing 5 in whose upward-turned end face a slot-shaped or out-of-round recess is provided for coupling an electrical screwdriver or the like. In this way the threaded spindle 7 can be turned comparatively rapidly by means of a motor-driven tool (a screwdriver in this case) to produce great changes in position of the base plate parts 3 and 4 accordingly.

To prevent the threaded spindle 7 from being visible or exposed to attack by dirt when the base plate parts 3 and 4 are set at a more or less great distance from the holding device housing 5, projections designed as corresponding

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covers 14 may be provided on the holding device housing 5. In the example illustrated in Figures 2 and 3, these covers 14 are designed as half pipes resting with their open longitudinal side on the top side of the ski. The edge of the base plate parts 3 and 4 facing the holding device housing 5 then has a recess which is adapted to the outside contour of the projections or the half pipes 14, through which recess the covers 14 can be inserted into the interiors of base plate parts 3 and 4.

Base plate parts 3 and 4 serve to arrange boot holding devices 15 and 16 on the toe end and on the heel end, said boot holding devices being arranged on the top side of the base plate parts 3 and 4 by means of corresponding fastening screws. This arrangement corresponds in design essentially to a direct rigging of the boot holding devices 15 and 16 on the top side of the ski.

One of the boot holding devices 15 and 16, usually boot holding device 16 on the heel end, is provided with a longitudinal guide 17 in which the boot holding device 16 can be displaced in a direction leading away from the holding device housing 5 against the force of a push-off resiliency (not shown). This creates in the known way a possibility of holding the ski boot, which is to be secured by means of boot holding devices 15 and 16, without any play. In addition, excessive tension on the boot in the boot holding devices 15 and 16 in the case of deflection of the ski is prevented due to the push-off resiliency.

By adjusting the longitudinal distance between the base plate parts 3 and 4, an adjustment to any desired boot sizes can be performed.

In deviation from the embodiment presented here, where the rails 2 are fixedly arranged on the ski 1 or are integrated into its structure, an arrangement in which the rails 2

form parts that can be detached from the ski 1 or are arranged on parts that can be detached from the ski 1 is also possible.

- 5 In addition, the holding device housing may also be designed entirely or partially as a part which is fixedly connected to the ski 1 or its structure or is integrated into the structure of the ski 1.

TABLE 1	
Summary of the results of the 1995-1996 survey of the health status of the population of the Republic of Serbia	
1. General characteristics of the population	
1.1. Total population	10,000,000
1.2. Urban population	6,000,000
1.3. Rural population	4,000,000
1.4. Population aged 15 and over	7,000,000
1.5. Population aged 65 and over	1,500,000
1.6. Population aged 75 and over	500,000
1.7. Population aged 85 and over	100,000
1.8. Population aged 95 and over	10,000
1.9. Population aged 100 and over	1,000
1.10. Population aged 105 and over	100
1.11. Population aged 110 and over	10
1.12. Population aged 115 and over	1
1.13. Population aged 120 and over	0
1.14. Population aged 125 and over	0
1.15. Population aged 130 and over	0
1.16. Population aged 135 and over	0
1.17. Population aged 140 and over	0
1.18. Population aged 145 and over	0
1.19. Population aged 150 and over	0
1.20. Population aged 155 and over	0
1.21. Population aged 160 and over	0
1.22. Population aged 165 and over	0
1.23. Population aged 170 and over	0
1.24. Population aged 175 and over	0
1.25. Population aged 180 and over	0
1.26. Population aged 185 and over	0
1.27. Population aged 190 and over	0
1.28. Population aged 195 and over	0
1.29. Population aged 200 and over	0
1.30. Population aged 205 and over	0
1.31. Population aged 210 and over	0
1.32. Population aged 215 and over	0
1.33. Population aged 220 and over	0
1.34. Population aged 225 and over	0
1.35. Population aged 230 and over	0
1.36. Population aged 235 and over	0
1.37. Population aged 240 and over	0
1.38. Population aged 245 and over	0
1.39. Population aged 250 and over	0
1.40. Population aged 255 and over	0
1.41. Population aged 260 and over	0
1.42. Population aged 265 and over	0
1.43. Population aged 270 and over	0
1.44. Population aged 275 and over	0
1.45. Population aged 280 and over	0
1.46. Population aged 285 and over	0
1.47. Population aged 290 and over	0
1.48. Population aged 295 and over	0
1.49. Population aged 300 and over	0
1.50. Population aged 305 and over	0
1.51. Population aged 310 and over	0
1.52. Population aged 315 and over	0
1.53. Population aged 320 and over	0
1.54. Population aged 325 and over	0
1.55. Population aged 330 and over	0
1.56. Population aged 335 and over	0
1.57. Population aged 340 and over	0
1.58. Population aged 345 and over	0
1.59. Population aged 350 and over	0
1.60. Population aged 355 and over	0
1.61. Population aged 360 and over	0
1.62. Population aged 365 and over	0
1.63. Population aged 370 and over	0
1.64. Population aged 375 and over	0
1.65. Population aged 380 and over	0
1.66. Population aged 385 and over	0
1.67. Population aged 390 and over	0
1.68. Population aged 395 and over	0
1.69. Population aged 400 and over	0
1.70. Population aged 405 and over	0
1.71. Population aged 410 and over	0
1.72. Population aged 415 and over	0
1.73. Population aged 420 and over	0
1.74. Population aged 425 and over	0
1.75. Population aged 430 and over	0
1.76. Population aged 435 and over	0
1.77. Population aged 440 and over	0
1.78. Population aged 445 and over	0
1.79. Population aged 450 and over	0
1.80. Population aged 455 and over	0
1.81. Population aged 460 and over	0
1.82. Population aged 465 and over	0
1.83. Population aged 470 and over	0
1.84. Population aged 475 and over	0
1.85. Population aged 480 and over	0
1.86. Population aged 485 and over	0
1.87. Population aged 490 and over	0
1.88. Population aged 495 and over	0
1.89. Population aged 500 and over	0
1.90. Population aged 505 and over	0
1.91. Population aged 510 and over	0
1.92. Population aged 515 and over	0
1.93. Population aged 520 and over	0
1.94. Population aged 525 and over	0
1.95. Population aged 530 and over	0
1.96. Population aged 535 and over	0
1.97. Population aged 540 and over	0
1.98. Population aged 545 and over	0
1.99. Population aged 550 and over	0
1.100. Population aged 555 and over	0
1.101. Population aged 560 and over	0
1.102. Population aged 565 and over	0
1.103. Population aged 570 and over	0
1.104. Population aged 575 and over	0
1.105. Population aged 580 and over	0
1.106. Population aged 585 and over	0
1.107. Population aged 590 and over	0
1.108. Population aged 595 and over	0
1.109. Population aged 600 and over	0
1.110. Population aged 605 and over	0
1.111. Population aged 610 and over	0
1.112. Population aged 615 and over	0
1.113. Population aged 620 and over	0
1.114. Population aged 625 and over	0
1.115. Population aged 630 and over	0
1.116. Population aged 635 and over	0
1.117. Population aged 640 and over	0
1.118. Population aged 645 and over	0
1.119. Population aged 650 and over	0
1.120.	